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BOOK REVIEWS

PHYSIOLOGICAL ECOLOGY OF THE ALPINE TIMBERLINE TREE EXISTENCE AT HIGH ALTITUDES WITH SPECIAL REFERENCE TO THE EUROPEAN ALPS, by W. Tranquillini, translated from the German by U. Benecke, with pp. xi + 137, 67 figures and 21 tables. ISBN 3–540–09065–7. Berlin, Heidelberg, New York: Springer-Verlag, 1979. Volume 31 in the series "Ecological Studies: Analysis and Synthesis", edited by W. D. Billings, F. Golley, O. L. Lange and J. S. Olson. Cloth DM 54, US $29.70.

The latest in this admirable series of substantially bound volumes based on decades of research work conducted over a range of plant formations, vegetation types and aquatic and terrestrial ecosystems. I remember reviewing the first of them in 1972; D. E. Reichle's *Analysis of temperate forest ecosystems*. It then cost R12,50. Its price today—R25! Tranquillini's perceptive "in depth" analysis is now R30,80.

One wonders how much longer we can continue to put up with this inflationary punishment. Admittedly, these ecologically-oriented volumes could be said to cater for a rather more "specialised" readership to whom the price may not be considered excessive, and most libraries can easily absorb the financial outlay. The less-affluent student, however, is finding the going very rough indeed. From my own experience, it is becoming very difficult to prescribe books for undergraduate courses. Students are referred to library shelves and this inevitably engenders frustration. The "overnight" shelf is a poor substitute for personal possession. Publishers might address themselves to this very real and increasing stumbling block to scholarship.

Price notwithstanding, I doubt very much whether any other comparable volume offers such value on the ecophysiology of high-altitude forests in Europe. Judging from the extraordinarily comprehensive bibliography a mass of information has been utilised in its preparation. It is a pity, although the omissions are perfectly in accord with his terms of reference, that the author has only evaluated the literature on Alpine forest areas outside Europe. Research on the Afro-Alpine regions of this continent, the work of Webster, Kitamura and others in Afghanistan and the Himalayas are completely excluded.

The layout is a model of precision and clarity. After a brief review of the chief features of Alpine timberlines, in which emphasis is concentrated on climatic-altitudinal plant adaptive relationships, the remainder of the text is divided into six sections embracing natural regeneration, growth, dry matter production, water relations, stress factors and resistance, and a final synoptic chapter.

The scientific facts assembled not only provide insight into the physical environment and the life processes of the woody components of the spectra occurring in the Alps but also provide agriculture and forestry with a sound foundation for the conservation and restoration of forests in mountainous areas generally. It thus has a significance far beyond the immediate context of Europe. Even in Africa, if the full protective value of mountain forests is to be realised, similar ecophysiological studies will be an important adjunct to the more pragmatic methods of silviculture.

It is to be hoped that the absolute necessity for restoring our catchment areas is now appreciated in this country. The situation further north is almost beyond redemption. Nevertheless, as the wise man said "In the Kingdom of the Blind the one-eyed man reigns". The strength of a Sovereign State is composed of many facets. Our decision-makers would be well-advised to husband their resources and we are dealing here with the most important resource of all.

Dr. Tranquillini is to be congratulated on the compilation of a package full of concentrated meat. Many could find nourishment in it.

O. KERFOOT

PHYSIOLOGY OF MOVEMENTS, edited by W. Haupt and M. E. Feinleib, with pp. xvii + 731, 185 figures and 19 tables. ISBN 3–540–08776–1. Berlin, Heidelberg, New York: Springer-Verlag, 1979. Volume 7 in "Encyclopedia of Plant Physiology, New Series", edited by A. Pirson and M. H. Zimmermann. Cloth DM 198, US $108,90.

Movement is an obvious expression of life and the fact that it is less conspicuous in plants is due only to its slower—and to the inexperienced eye well nigh unobservable—occurrence in members of this Kingdom. Seen *in toto*, movement is a phenomenon which encompasses a spectrum so wide that even an encyclopaedic volume might not fully do it justice. So, for example, cohesion—and explosion-induced movements have had to be excluded from the book under review, and by far not all the tropistic and nastic movements have been covered.

In a book of this nature—to which 27 authors contributed 25 chapters—it is impossible to provide the Strasburger-type of integrated, comprehensive overview and, as increasingly seems to be the case, the respective treatments are presentations by individuals of their own highly specialized subject areas, with the integration undertaken by editors Haupt and Feinleib in the relatively short Introduction.

The physiology of movement, a research area dominated in the past by German botanists, is receiving wider international attention and although the names of some prominent workers (e.g. Kamiya, Bünning) do not feature among the contributors to this book, those of persons who have made significant contributions in this field do (e.g. Sweeney, Wilkins, Raschke, Johnsson). The subject matter falls into four basic parts: (1) locomotion in microbial plants, (2) intracellular movements, (3) turgor-based movements and (4) growth movements. Growth movements are discussed in terms of those directed by light and gravity, and those not directed primarily by stimuli of external origin.

Raschke's chapter on stomatal movement is excellent and particularly appropriate in view of the current interest in the mechanisms which control the opening and closing of the pore, and Johnsson's on circumnutation is an interesting discussion of models that might underlie this phenomenon.

Johnsson, known for his work on oscillatory water transport, is a physicist who is engaged in botanical research. Reading his chapter only underscores the notion that physics and mathematics undeniably are valuable complementary subjects to the study and better understanding of physiological botany.

This well-produced, well-researched treatise, with its extensive author and subject indices, is highly recommended for institutional library shelves as well as for those of the botanists interested in aspects of the physiology of movement from both research and teaching points of view.

CHRIS H. BORNMAN

PLANTKUNDE: ORGANOGRAFIE EN SITOLOGIE,* deur W. F. Reyneke, L. A. Coetzer en N. Grobbelaar, met pp. 133. Durban: Butterworths, 1979. R7,23.

Hierdie boekie is een van 'n reeks van vier teorieboeke en een praktiese handleiding wat deur dosente van die Departement Plantkunde aan die Universiteit van Pretoria geskryf is. Die reeks boekies dek die kursus vir Plantkunde I wat tans deur studente aan hierdie universiteit gevolg word. Die skrywers het van die veronderstelling uitgegaan dat die studente wat dit sal gebruik oor feitlik geen biologie-agtergrond beskik nie.

Die inhoud van die boekie is in tien hoofstukke verdeel. Hoofstuk 1 is inleidend van aard en gee onder andere 'n oorsig oor die ontstaan van lewe op die aarde, 'n verdeling van lewende organismes en 'n uiteensetting van die verskillende vakgebiede van die plantkunde.

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* Review first published in the *South African Journal of Science*.

Die orige nege hoofstukke is verdeel in die twee afdelings, organografie en sitologie. In die afdeling organografie word 'n oorsig oor die uitwendige bou van blomplante (Anthophyta) gegee. Daar is sewe hoofstukke waarin die bou en funksies van wortels, stingels, blare, bloeiwyses, blomme, vrugte en sade bespreek word. Die afdeling sitologie bestaan uit twee hoofstukke: in die eerste hoofstuk word daar 'n uiteensetting van die ultrastruktuur van die plantsel met sy membrane en organelle gegee, en in die laaste hoofstuk word mitose bespreek.

Die taalgebruik in die boekie is goed. Die beskrywings is op 'n sistematiese wyse uiteengesit en lees maklik. Tegniese terme verskyn in vetdruk sodat dit onmiddellik die aandag trek en die student sal help om dit te memoriseer. Die teks word uitstekend toegelig met sketse en foto's wat almal van 'n hoë gehalte is. Altesaam 143 figure is gebruik. Dit is veral verblydend dat die skrywers sover moontlik voorbeelde van Suid-Afrikaanse plante gebruik. Dit behoort die belangstelling in ons inheemse flora te stimuleer.

Die skrywers het met baie terme afgewyk van dié in die *Plantkundewoordeboek* van die Suid-Afrikaanse Akademie vir Wetenskap en Kuns. In sommige gevalle was dit geregverdig om af te wyk, maar in ander gevalle is daar myns insiens onnodige nuwe terme geskep. Die behoefte en noodsaaklikheid om die *Plantkundewoordeboek* te hersien, word dus weer eens onderstreep.

Enkele klein vakkundige foute is ook opgemerk. In hoofstuk 10 word daar byvoorbeeld gemeld dat mitose uit twee fases — kariokinese en sitokinese — bestaan, terwyl die algemene opvatting is dat mitose en kariokinese sinoniem is.

Alles in ag geneem, moet die skrywers en die uitgewer gelukgewens word met 'n puik werk wat die lig gesien het. Dit is 'n mooi bydrae tot die Afrikaanse vakliteratuur. Die boekie sal nie alleen vir universiteitstudente van groot waarde wees nie, maar sal ook met groot vrug deur biologie-onderwysers op hoërskole gebruik kan word.

J. J. A. van der Walt

PRAKTIESE PLANTKUNDE,* deur W. F. Reyneke, P. D. F. Kok en N. Grobbelaar, met pp. 105. Durban: Butterworths, 1979. R7,23.

Hierdie handleiding vir eerstejaarstudente is die vyfde in 'n reeks van vier boeke wat die teorie dek en hierdie enkele volume vir die praktiese werk. Die werk voorsien in 'n lank gevoelde behoefte in die Departement Plantkunde aan die Universiteit van Pretoria, maar ook wyer aan Plantkunde-departemente aan ander opleidingsentrums. Soos die outeurs dit in die voorwoord stel, dek hierdie boek meer as wat gewoonlik in so 'n inleidende kursus aangebied word sodat dit met vrug gebruik kan word in kursusse waarvan die leerplanne effens anders daar uitsien.

Die belangrikste onderdele waaraan die outeurs aandag skenk, is die organografie en anatomie van wortels, stingels en blare, die bou van bloeiwyses en blomme, mitose, meiose en genetika, asook 'n studie van 'n aantal verteenwoordigers van die Monera, Protista, Fungi en Plantae.

Die tegniese versorging van die werk is van hoë gehalte, met slegs 'n paar uitsonderings, soos die foto's wat die gedeelte oor die ligmikroskoop illustreer. Die gebruik van 'n donkerder agtergrond om sekere gedeeltes te beklemtoon, is hoogs geslaag. Daar word slegs van illustrasies gebruik gemaak waar dit nodig is en studente word dus ook na ander werke verwys, wat die oorteken van sketse uit die handboek tot 'n minimum sal beperk. Lofwaardig is ook die pogings van die outeurs om die belangrikheid van die korrekte voorbereidings- en tekentegniek by die leser tuis te bring.

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* Review first published in the *South African Journal of Science*.

Die simbole wat by die konstruering van blomdiagramme en blomformules gebruik word, word duidelik geïllustreer saamgevat. Dit voorsien in 'n werklike behoefte en sal sekerlik wyer as net deur eerstejaarstudente gebruik word. Sommige terme wat gebruik word, mag hier en daar die leser se wenkbroue laat lig, maar al verskil die leser van die outeurs, is daar 'n aantal navolgenswaardige voorbeelde van sinvolle taalgebruik, byvoorbeeld die ietwat onbekende gebruik van *kieming* in plaas van die meer algemene (en miskien foutiewe) *ontkieming*.

Die groepering van die leerstof is soms vreemd, byvoorbeeld die bespreking van die gebruike van radioaktiewe isotope saam met die blaaranatomie, maar die optimale benutting van klastyd veroorsaak sekerlik dergelike situasies in enige kursus, waar dit ook al aangebied word.

Geen plantkundige aan enigeen van die instansies waar opleiding in die vak aangebied word, sal sonder sy eksemplaar van hierdie publikasie wil wees nie, en dit kan en sal sekerlik met groot vrug deur junior en selfs meer senior studente gebruik word.

Die outeurs moet gelukgewens word met 'n goed deurdagte publikasie wat slegs 'n positiewe bydrae tot die dosering van die vak kan lewer.

J. COETZEE

ANNOUNCEMENT

The publication is announced of EXCELSA 8 and EXCELSA TAXONOMIC STUDIES NO. 2 *(A review of Tridentea Haw. Asclepiadaceae)*. These are both obtainable from Excelsa, P.O. Box 8514, Causeway, Salisbury, Zimbabwe.